REMARKS

Allowable Subject Matter

The Examiner has allowed Applicant's claim 33 and has objected to Applicant's claims 4-5, 7, 26-27 and 29 as being dependent upon a rejected base claim and states that these claims would be allowable if rewritten in independent form to include all of the limitations of the base claim and any intervening claims. Furthermore, the Examiner has rejected the Applicant's claims 6 and 28.

In response, the Applicant hereby amends claims 4 and 26 to be in independent form and to include all of the limitations of the base claim and any intervening claims thereof and respectfully asserts that amended claims 4 and 26 are now in condition for allowance. Additionally, the Applicant respectfully asserts that because claims 5-7 and claims 27-29 are dependent, either directly or indirectly, from amended claims 4 and 26, respectively, claims 5-7 and claims 27-29 must now also be in condition for allowance. As such, early and favorable action regarding the Applicant's amended claims 4 and 26 and dependent claims 5-7 and 27-29 is therefore respectfully solicited.

Status of Claims 17-20

In the "Office Action Summary" page of the outstanding Office Action, claims 17-20 are listed as rejected. Claims 18-20 depend from claim 17, which depends from claim 11. However, in the "Detailed Action" portion of the outstanding Office Action, there is no explicit rejection of claims 17-20. Furthermore, claim 17 has subject matter similar to the subject matter in claims 4 and 26, which, as stated above, the Examiner objected to these claims as being dependent upon a rejected base claim and states that these claims would be allowable if rewritten in independent form to include all of the limitations of the base claim and any intervening claims. Consequently, it is believed that claim 17, like claims 4 and 26, are allowable if rewritten in independent form to include all limitations of the base claim and any intervening claims. Applicants have rewritten claim 17 in independent form to include

all limitations of the base claim and any intervening claims. It is therefore believed that claim 17 and its dependent claims 18-20 are patentable.

35 U.S.C. §103 Rejections

Generally, the Examiner has rejected the Applicant's claims 1-3, 6, 8-16, 21-25, 28 and 30-32 as being unpatentable under 35 U.S.C. § 103(a). Specifically, the Examiner has rejected the Applicant's claims 1-3, 8-16, 21-25 and 30-32 as being unpatentable over Applicant's Admitted Prior Art in view of U.S. Patent Publication No. 2004/0213363 to Bottomley et al. (hereinafter "Bottomley"). The Applicant respectfully disagrees with the Examiner's rejections and requests reconsideration in light of the discussion hereinafter.

It is well established that in order for an obviousness rejection to be proper, the Patent Office must meet the burden of establishing a prima facie case for obviousness. Thus, the Patent Office must meet the burden of establishing that all elements of the invention are disclosed in the prior art and that in accordance with In re Lee (see below), the prior art must contain a suggestion, teaching, or motivation for one of ordinary skill in the art to modify a reference or combined references; and that the proposed modification must have had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. In re Fine, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988); In re Wilson, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970); Agmen v. Chugai Pharmaceuticals Co., 927 U.S.P.Q.2d, 1016, 1023 (Fed. Cir. 1996); In re Sang Su Lee, 277 F.3d 1338, 61 U.S.P.Q.2d 1430 (Fed. Cir. 2002).

Claim 1 Rejection

Regarding the Examiner's rejection of the Applicant's claim 1, the Examiner asserts that the "Admitted Prior Art teaches a method to receive a code division multiple access (CDMA) signal from a radio channel, comprising: inputting a CDMA signal received through the radio channel to a searcher; and processing the received signal in the searcher to obtain a multi-path profile of the radio channel" and that "a conventional searcher produces the multi-path profile using a convolution of the transmit/receive filters and the radio

channel." Using this as support, the Examiner asserts that by "using convolution the prior art is in fact applying a concept of matched filtering; i.e.; applying filter with an impulse response which is a time-reversal version of the transmit filter which amounts to applicant's "removing an effect of at least one of a transmit and a receive filter on the multipath profile"."

Referring to paragraphs [0024], [0034] and [0035] and claims 13 and 23 of Bottomley, the Examiner further asserts that Bottomley "teaches methods and receivers that estimate multi-path delays by removing signal rays from a power-delay profile where processing comprises at least partially removing an effect of at least one of a transmit and a receive filter on a multi-path profile." In light of this the Examiner asserts that it would have been obvious to one skilled in the art to incorporate the teachings of Bottomley as a method of improving the accuracy of signal path delays. The applicant respectfully asserts that the Examiner has misinterpreted both the background section of the Applicant's specification and the teachings of Bottomley.

It should be noted that Applicant in no way admits that any of the materials in the Background section of the specification are Admitted Prior Art. Furthermore, the Applicant respectfully amends claim 1 to include processing using deconvolution to more clearly claim the Applicant's invention. The Applicant asserts that no new matter has been added due to this amendment and that support for this amendment may be found in the Applicant's Figure 3A and throughout the detailed description.

In response to the Examiners rejection, the Applicant asserts that, as required by the court in In re Lee (see footnote 4), the Examiner has failed to provide any suggestion, teaching or motivation to modify Bottomley to obtain the Applicant's invention as recited in Applicant's amended claim 1. In fact, review of the paragraphs and claims relied upon by the Examiner (i.e. paragraphs [0024], [0034] and [0035] and claims 13 and 23 of Bottomley), indicates that although Bottomley recognizes that the use of "signal shaping filters in a transmitter and/or receiver can further blur the combined signals and complicate the finding of individual signal peak values," Bottomley merely teaches removing noise in the communication channel whose level "may be measured during gaps between information

signals." (See page 3, paragraph [0029] of Bottomley) Thus, Bottomley actually teaches away from removing the contributions of a transmitter or receiver, as recited in Applicant's amended claim 1, by focusing solely on the communication channel noise. This is further supported by Bottomley's claim 13 which claims removing "at least a portion of the contributions to the first PDP [power delay profile] sequence associated with the first delay value", wherein the delay values are based on noise in the communications channel. (See pages 2-3, paragraphs [0026] and [0034].)

Moreover, the Applicant respectfully could not find any suggestion, teaching or motivation to modify Bottomley to obtain the Applicant's invention as recited in Applicant's amended claim 1. In fact, Bottomley does not mention the word "deconvolution", let alone teach deconvoluting a signal to remove receiver and/or transmitter contributions as recited in Applicant's amended claim 1. Although claim 23 of Bottomley does claim generating the predefined PDP sequence based on a convolution of an estimate of the response of a receiver filter, a transmitter filter or both, Bottomley merely teaches subtracting the channel noise from the predefined PDP sequence. This is very different from exemplary embodiments of the Applicant's invention which deconvolutes the signal to remove the contribution of a receiver filter, a transmitter filter or both. In light of the discussion hereinbefore regarding the Applicant's amended claim 1, it should be clear that the Examiner has not satisfied the burden of establishing a prima facie case for obviousness. As such, the Applicant respectfully asserts that amended claim 1 is patentably unobvious over the cited art.

The Examiner again makes an argument that the concept of matched filtering amounts to removing an effect of at least one of a transmit and a receive filter on the multipath profile. As stated in the prior Response, it is believed that a matched filter uses a receive filter that is designed to "match" the transmitted *signal*. In other words, a matched filter has an impulse response h(t), where h(t)=s(T-t), and s(t) is the transmitted signal. The matched filter is related to the *signal* and not to a transmit filter. Therefore, even if a matched filter is being used in a receive filter, the receive filter would not necessarily remove an effect of a transmit filter (or a receive filter) on the multipath profile. In a previously enclosed

Information disclosure statement, Applicant submitted two references (Proakis and Lathi) discussing matched filters. Moreover, as described in Proakis, there would be N such matched filters, one for each of N basis functions that can be used to create transmitted signals. As can be determined using Proakis, the largest value from N such matched filters is selected as the optimum signal output. See FIGS. 5-1-7 and 5-1-9 and associated text. This process works because the response of the matched filter is a time-autocorrelation function of the transmitted signal. Proakis, page 239. Consequently, if a transmitted signal is not "matched" to a particular matched filter, there will be a less than optimal output from the particular matched filter. By contrast, when the transmitted signal and the matched filter are "matched", the output will be optimal and highest. The matched filter therefore is matched to the transmitted *signal* and a matched filter does not appear to remove an effect of a transmit or receive filter on a multi-path profile.

Regarding the Examiner's rejections of Applicant's claims 2-3 and 8-9, the Applicant respectfully asserts that claims 2-3 and 8-9 depend directly from the Applicant's amended claim 1 and because amended claim 1 is patentably unobvious over the cited art, claims 2-3 and 8-9 must also be patentably unobvious over the cited art. However, regarding the Examiner's rejection of the Applicant's claim 3, the Applicant respectfully cannot understand how the Examiner can convert Bottomley's statement in paragraph [0030] that "an original PDP sequence 50 (Fig. 5a) is produced for a sequence of sample delay times by determining the magnitude-squared of the complex correlation values of the received signal" to a filter having "a filter characteristic that approximates an inverted amplitude or power response of the at least one of the transmit filter or the receive filter," as recited in the Applicant's claim 3. Moreover, the same is true regarding the Examiner's rejections of Applicant's claims 8 and 9. As such, in light of the current state of the law, the Applicant respectfully requests that the Examiner clarify how these interpretations were made.

Claim 10 Rejection

Regarding the Examiner's rejection of the Applicant's claim 10, the Applicant respectfully disagrees with the Examiner's conclusion and references the discussion

hereinbefore regarding the Examiner's rejection of the Applicant's claim 1. Specifically, Bottomley teaches removing channel noise and does not teach removing "an effect of at least said receiver filter on the multi-path profile" via deconvolution, as recited in Applicant's claim 10. In rejecting claim 10, the Examiner refers the Applicant to elements 16, 18 and 20 of Bottomley's Figure 1 and erroneously equates these elements with the deconvolution searcher block of claim 10. Referring to elements 16, 18 and 20 of Bottomley's Figure 1, it should be clear that Bottomley merely discloses feeding a demodulated signal back into a correlator. This is very different from deconvoluting a signal to remove unwanted effects.

The Applicant would like to remind the Examiner that, simply put, demodulation is a process by which an information signal that has been modulated with a carrier signal is removed from carrier signal. In the modulation process the information signal is superimposed onto the carrier signal in a known fashion and as such, is removed in the same way. However, convolution is a process by which two functions (f and g) are convolved together to generate a third function h, (i.e. f *g = h), which represents the amount of area determined by sliding one of the functions "over" a reversed version of the other of the functions for some distance, usually taken as the x axis. As such, if the third function h has been produced by convolution, then one of the two convolved functions (f, g) may be determined by deconvolving the third function h. This is not the same as or equivalent to demodulating a signal and feeding it back into the circuit as shown in Bottomley's Figure 1.

Thus, in light of the discussion hereinbefore regarding the Applicant's claim 10, it should be clear that the Examiner has not satisfied the burden of establishing a prima facie case for obviousness. As such, the Applicant respectfully asserts that amended claim 10 is patentably unobvious over the cited art. Moreover, regarding the Examiner's rejections of Applicant's claims 11-20, the Applicant respectfully asserts that claims 11-20 depend, either directly or indirectly, from the Applicant's claim 10 and because claim 10 is patentably unobvious over the cited art, claims 11-20 must also be patentably unobvious over the cited art.

Claim 21 Rejection

Regarding the Examiner's rejection of the Applicant's claim 21, the Applicant respectfully disagrees with the Examiner's conclusion and again references the discussion hereinbefore regarding the Examiner's rejection of the Applicant's amended claim 1 and claim 10. Furthermore, the Applicant respectfully amends claim 21 to include "a unit to at least partially remove, via deconvolution, an effect of at least said receiver filter on the multi-path profile" to more clearly claim the Applicant's invention. The Applicant asserts that no new matter has been added due to this amendment and that support for this amendment may be found in the Applicant's Figure 3A and throughout the detailed description.

Thus, for the same reasons as stated hereinabove regarding the Applicant's amended claim 1 and claim 10, the Applicant asserts that the cited art does not provide any teaching, suggestion or motivation to modify Bottomley to obtain the Applicant's invention as recited in Applicant's amended claim 21. As such, the Applicant respectfully believes that the Examiner has not satisfied the burden of establishing a prima facie case for obviousness and asserts that amended claim 21 is patentably unobvious over the cited art. Moreover, regarding the Examiner's rejections of Applicant's claims 22-25 and 30-31, the Applicant respectfully asserts that claims 22-25 and 30-31 depend, either directly or indirectly, from the Applicant's amended claim 21 and because amended claim 21 is patentably unobvious over the cited art, claims 22-25 and 30-31 must also be patentably unobvious over the cited art.

Claim 32 Rejection

Regarding the Examiner's rejection of the Applicant's claim 32, the Examiner asserts that the "Admitted Prior Art discloses in a mobile station, a method to reduce an amount of data provided to finger assignment algorithm, comprising inputting a CDMA signal received through the radio channel to a searcher; and processing the received signal in the searcher to generate output data for the finger assignment algorithm that represents a multi-path profile of the radio channel, where processing comprises passing the received CDMA signal through a filter selected to have a characteristic that approximates an inverted response of at least one of a base station transmit filter." The Examiner further asserts that

Bottomley "discloses at least one mobile station receive filter used to reduce an occurrence of multi-path sidelobes in the output data (pg. 2, paragraph 0023, pg. 3, paragraph 0036)." Using this as support and referring to page 1, paragraph 0010 of Bottomley, the Examiner asserts it would have been obvious to incorporate the teachings of Bottomley as a method of improving the accuracy of signal path delays. The applicant respectfully disagrees with the Examiner's conclusions and asserts that the Examiner has misinterpreted both the background section of the Applicant's specification and the teachings of Bottomley.

Again, it should be noted that Applicant in no way admits that any of the materials in the Background section of the specification are Admitted Prior Art. Nonetheless, assuming for sake of argument that the materials in the Background section are Admitted Prior Art (to which Applicant does not agree), there is no mention in the Background section of at least the subject matter of "where processing comprises passing the received CDMA signal through a filter selected to have a characteristic that approximates an inverted response of at least one of a base station transmit filter or at least one mobile station receive filter" recited in claim 32. Therefore, this subject matter is not present in the Background section.

Furthermore, this subject matter is not disclosed or implied by Bottomley. Bottomley states that "The predefined PDP sequence may represent the PDP sequence of a received signal in a signal path channel, and *may be approximated as the magnitude square of a convolution of the signal filters* in a transmitter and/or a receiver." Bottomley, paragraph [0035] (emphasis added). The "magnitude square of a convolution of the signal filters" in Bottomley is not seen to disclose or imply "a filter selected to have a characteristic that approximates an *inverted* response of at least one of a base station transmit filter or at least one mobile station receive filter" as recited in independent claim 32. The combination of Bottomley and the purported Admitted Prior Art does not disclose or imply this subject matter, and claim 32 is patentable over Bottomley and the purported Admitted Prior Art.

Furthermore, claim 32 recites "where processing comprises passing the received CDMA signal through a filter selected to have a filter characteristic that approximates an inverted response of at least one of a base station transmit filter or at least one mobile station receive filter so as to reduce an occurrence of multi-path sidelobes in the

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output data." In the exemplary embodiment of claim 32, it is beneficial to reduce the occurrence of multi-path sidelobes in output data.

By contrast, Bottomley relies on the multi-path "sidelobes" in order to determine multi-path data. For instance, referring to pg. 2, paragraph 0023 and Figure 2 of Bottomley states that "the filter causes the path image to be spread out in a main-lobe and side-lobes." Bottomley also states the following:

> The power delay estimator 18 removes at least some of the effects of multi-path interference in the PDP sequence to produce improved estimates of the multi-path delays. With reference to the example two path PDP sequence that is illustrated in FIG. 3, the power delay estimator 18 determines a signal power level value from the PDP sequence (i.e., 1). The power delay estimator 18 then scales a predefined PDP sequence using the signal power level value to provide a reference PDP sequence. For example, the signal power level value may be determined by subtracting a noise power level from the peak of the PDP sequence. The predefined PDP sequence may be an estimate of a PDP sequence for a single path channel, such as that illustrated in FIG. 2. The power delay estimator 18 then removes the reference PDP sequence from the two path PDP sequence (i.e., FIG. 3), to produce a modified PDP sequence, as illustrated in FIG. 4. The modified PDP sequence illustrated in FIG. 4 corresponds to the signal that is received from the second signal path in the communication channel 8, and, as illustrated, its peak accurately occurs at a delay of 1.

Bottomley, paragraph [0026]. In other words, there is a main lobe shown at delay zero in Figure 3 of Bottomley and a side lobe shown at a location after delay of one in Figure 3 of Bottomley. The side lobe actually should occur at a delay of one. Bottomley processes the signal shown in Figure 3 in order to determine the signal received from the second signal path (shown in Figure 4), which corresponds to the side lobe shown in Figure 3. The signal shown in Figure 4 is important in Bottomley to determining signal path delay. Bottomley performs processing to remove the main lobe such that the side lobe may be determined. Therefore, the side lobes in Bottomley are important and Bottomley would not want the occurrence of the side lobes to be reduced, or else the signal path delay information carried by the side lobes could be lost. Consequently, Bottomley teaches away from reducing an occurrence of multi-path side lobes in the output, as recited in independent claim 32.

In light of the above, the Applicant asserts that the cited art does not provide any teaching, suggestion or motivation to modify Bottomley to obtain the Applicant's invention as recited in Applicant's claim 32. As such, the Applicant respectfully believes that the Examiner has not satisfied the burden of establishing a prima facie case for obviousness and asserts that claim 32 is patentably unobvious over the cited art.

New Claims 35-38

Applicants have added new claims 33-36, which are supported, e.g., by FIGS. 3A-3D and page 8, lines 6-20, and page 3, lines 9-12. Independent claim 35 contains subject matter similar to the subject matter in claim 10 and therefore the arguments given above with respect to claim 10 are equally valid for claim 35.
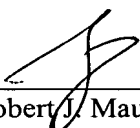
Conclusion

In light of the above discussion, it is should be clear that the combination Bottomley and the Admitted Prior Art (which Applicant does not admit is Admitted Prior Art) does not contain all of the elements of any of the claims of the Applicant's invention, and that the combination of Bottomley and the Admitted Prior Art (which Applicant does not admit is Admitted Prior Art) is inappropriate. As such, the Applicant respectfully requests that the Examiner reconsider and withdraw these rejections.

For the foregoing reasons, the Applicant believes that each and every issue raised by the Examiner has been adequately addressed and that this application has now been placed in condition for allowance. As such, early and favorable action is therefore respectfully solicited.

Based on the foregoing arguments, it should be apparent that claims 1-33 are thus allowable over the reference(s) cited by the Examiner, and the Examiner is respectfully requested to reconsider and remove the rejections. The Examiner is invited to call the undersigned attorney for any issues.

Respectfully submitted:

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